

SUPER THERMAL GREASE III

8617

Safety Data Sheet

Section 1: Identification

Product Identifier and Other Means of Identification

Product Name: Super Thermal Grease III**SDS Code:** 8617**Related Part #** 8617-85ML, 8617-1P, 8617-1G

Recommended Use and Restriction on Use

Use: Thermal interface grease for improving heat flow between the CPU and heat sink**Uses Advised Against:** Not applicable

Details of Manufacturer or Importer

Manufacturer
MG Chemicals
1210 Corporate Drive
Burlington, Ontario L7L 5R6
CANADA

MG Chemicals (Head Office)
9347-193 Street
Surrey, British Columbia V4N 4E7
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Emergency Phone Number

For hazardous material incidents ONLY (leaks, spills, fires, exposures or accidents)
USA or CANADA—Call CHEMTREC at **+1-800-424-9300****For emergencies involving the transport of dangerous goods;** 24/7 service
CANADA—Call CANUTEC collect at **+1-613-996-6666** or ***666** on cellular phones

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Section 2: Hazard(s) Identification
Classification of Hazardous Chemical
GHS Categories

This product is not regulated according to HCS 2012 and WHMIS 2015 classification criteria.

Label Elements

Signal Word	<i>None Mandated</i>
Pictograms	Hazard Statements
<i>None mandated</i>	None

Hazards Not Otherwise Classified

Other Criteria	Hazard Statements/Precautionary Statement	Signal Word	Pictograms
None	None	None	None

Section 3: Composition/Information on Ingredients

CAS #	Chemical Name	%(weight)
1344-28-1	aluminum oxide	55-65%
12001-85-3	naphthenic acids, zinc salts	1-5%

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Section 4: First-Aid Measures

<i>Exposure Condition</i>	<i>GHS Code/Symptoms/Precautionary Statements</i>
IF IN EYES	P305 + P351 + P338, P337 + P313
Immediate Symptoms	<i>mild irritation</i>
Response	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention
IF ON SKIN	P302 + P352, P332 + P313
Immediate Symptoms	<i>mild irritation</i>
Response	Wash with plenty of water. If skin irritation occurs: Get medical advice or attention.
IF INHALED	P304 + P340 <i>(Not a likely route of exposure under normal use)</i>
Immediate Symptoms	<i>Low toxicity</i>
Response	Remove person to fresh air (out of the contaminated zone) and keep comfortable for breathing.
IF SWALLOWED	P301, P330, P331, P312 <i>(Not a likely route of exposure under normal use)</i>
Symptoms	<i>Low toxicity</i>
Response	Rinse mouth. Do NOT induce vomiting. If feeling unwell: Call a POISON CENTRE or doctor

SUPER THERMAL GREASE III**8617****Section 5: Fire-Fighting Measures**

Extinguishing Media	In case of fire: Use extinguishing media suitable for surrounding material.
Specific Hazards	Not flammable or combustible, but burns if involved in a fire. Avoid breathing combustion products.
Combustion Products	Produces carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), aluminum oxides, boron oxides, toxic fumes, and smoke.
Fire-Fighter	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

Section 6: Accidental Release Measures

Personal Protection	Use personal protection recommended in Section 8.
Precautions for Response	Avoid breathing the vapors, mist, and fumes.
Environmental Precautions	Avoid releasing to the environment.
Containment Methods	Not applicable—not readily flowable
Cleaning Methods	Collect paste in a sealable, solvent-resistant container. Sprinkle inert absorbent compound onto spill, then sweep into the container. Wipe up further residue with paper towel and place dirty towels in container. Wash spill area with soap and water to remove the last traces of residue.
Disposal Methods	Dispose spill waste according to Section 13.

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Section 7: Handling and Storage

Prevention	Avoid breathing fumes. Do not eat, drink, or smoke when using this product.
Handling	Wear protective gloves and eye protection. RECOMMENDATION: Wear neoprene, butyl rubber, nitrile or other impervious gloves with breakthrough time greater than intended use period. Wash hands thoroughly after handling.
Storage	No special storage instructions needed. RECOMMENDATION: Keep in a dry and clean area, away from incompatible substances.

Section 8: Exposure Controls/Personal Protection
Substances with Occupational Exposure Limit Values

Chemical Name	Country	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
aluminum oxide (dust/mist)	ACGIH	1 mg/m ³	Not established
	U.S.A. OSHA PEL	15 mg/m ³ a)	Not established
	Canada AB	10 mg/m ³	Not established
	Canada BC	3 mg/m ³	10 mg/m ³
	Canada ON	Not established	Not established
	Canada QC	10 mg/m ³	Not established

Note: Ingredients are listed in descending weight contribution order (from greatest to least). The ACGIH¹, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from the RTECS database² and from suppliers' SDS were also consulted. Short term exposure limits (STEL) are usually for 15 min and long term permissible exposure limits (PEL) for 8 h.

a) Total dust limit allowed

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SUPER THERMAL GREASE III**8617****Engineering Controls****Ventilation**

Keep airborne concentrations below the occupational exposure limits (OEL).

Note: Since all particles are inextricably bound in the grease, no respirable airborne particles are possible during normal use.

Personal Protective Equipment**Eye protection**

Wear appropriate protective eyeglasses or chemical safety goggles.

RECOMMENDATION: Use safety glasses with lateral protection (side shields).

Skin Protection

Wear appropriate protective clothing to prevent skin contact.

RECOMMENDATION: Use of protective gloves in butyl rubber, latex, neoprene, or other chemically resistant gloves.

Respiratory Protection

In the unlikely event of exposure to mist, wear oil resistant or oil proof particulate respirators or filter masks.

RECOMMENDATION: Consult your local safety supply store to ensure your respirator or mask.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

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Section 9: Physical and Chemical Properties

Physical State	Solid	Lower Flammability Limit	Not applicable
Appearance	White, grease	Upper Flammability Limit	Not applicable
Odor	Low odor	Vapor Pressure @25 °C	Not available
Odor Threshold	Not available	Vapor Density	Not available
pH	Not available	Relative Density @25 °C	1.96
Freezing/Melting Point	Not available	Solubility in Water	<0.1%
Initial Boiling Point	Not available	Partition Coefficient n-octanol/water	Not available
Flash Point ^{a)}	550 °C [1 022 °F]	Auto-ignition Temperature	Not available
Evaporation Rate	Not available	Decomposition Temperature	Not available
Flammability (solid, gas)	Not available	Viscosity @40 °C	>20.5 mm ² /s

a) Based on synthetic oil component Cleveland open cup value

Section 10: Stability and Reactivity

Stabilities	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Very high heat (such as soldering or welding) and incompatible substances.
Incompatibilities	Halogenated compounds, strong oxidizing agents, strong acids, strong bases
Polymerization	Will not occur
Decomposition	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5.

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Section 11: Toxicological Information
Summary of Effects and Symptoms by Routes of Exposure

Eyes	May cause mild eye irritation, redness. The aluminum oxide is mechanically abrasive.
Skin	May cause mild skin irritation.
Inhalation	None expected under normal conditions. When heated to extreme temperatures, product fumes or combustion gases may result in toxic gas emissions.
Ingestion	No acute toxicity effect known.
Chronic	Prolonged or repeated inhalation exposure to aluminum oxide particles may lead to lung scarring and reaction to dust deposition in the lungs.

Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation
aluminum oxide	>5 000 mg/kg Rat ^{a)}	Not established	Not established
naphthenic acids, zinc salts	4 920 mg/kg Rat	>2 g/kg Rabbit	11 600 mg/m ³ Rat 4 h

Note: Toxicity data from the RTECS² and ECHA databases were consulted. The data from supplier SDS were also consulted.

Other Toxicological Effects

Skin corrosion/irritation	Based on available data, classification criteria are not met.
Serious eye damage/irritation	Based on available data, classification criteria are not met.
Sensitization (allergic reactions)	Based on available data, classification criteria are not met.
Carcinogenicity (risk of cancer)	Not classified or listed as a carcinogen by IARC, ACGIH, CA Prop 65, or NTP.

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Mutagenicity (risk of heritable genetic effects)	Based on available data, classification criteria are not met.
Reproductive Toxicity (risk to sex functions)	Based on available data, classification criteria are not met.
Teratogenicity (risk of fetus malformation)	Based on available data, classification criteria are not met.
STOT-single exposure	Based on available data, classification criteria are not met.
STOT-repeated exposure	Based on available data, classification criteria are not met.
Aspiration hazard	Classification criteria are not met: the mixture does not contains Class 1 aspiration toxicant and its viscosity is $>20.5 \text{ mm}^2/\text{s}$ at $40 \text{ }^\circ\text{C}$

Section 12: Ecological Information

Ecological classifications are based on the IMDG/GHS criteria in conjunction with ecotoxicological data from our suppliers, the European Chemical Agency database (<http://echa.europa.eu>), and other reliable sources.

The synthetic oils used in this product is reported by the supplier to be a Category 4 chronic aquatic toxicant.

The on available data, the naphthenic acids, zinc salts is a Category 1 chronic aquatic toxicant.

Based on data available, aluminum oxide doesn't meet the criteria of ecological toxicants.

Acute Ecotoxicity

Based on available data, does not meet the classification criteria.

Chronic Ecotoxicity

Based on available data, does not meet the classification criteria.

Biodegradability

Not readily biodegradable

Other Effects

Not available

SUPER THERMAL GREASE III**8617****Section 13: Disposal Information**

Dispose of contents in accordance with all local, regional, national, and international regulations.

Section 14: Transport Information**Ground**

Refer to TDG regulations (Canadian Transportation of Dangerous Goods regulations) and **US DOT 49 CFR** (Parts 100 to 185) **Regulations.**

Not Regulated

Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Not Regulated

Sea

Refer to IMDG Dangerous Goods Regulations.

Not Regulated

Section 15: Regulatory Information**Canada****Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)**

All hazardous ingredients are listed on the DSL/NDSL.

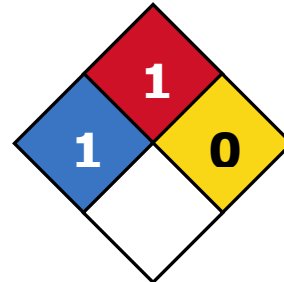
Hazardous Products Act (R.S.C., 1985, c. H-3)

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2015.

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SUPER THERMAL GREASE III**8617****USA****Other Classifications****HMIS® RATING**

HEALTH:	* 1
FLAMMABILITY:	1
PHYSICAL HAZARD:	0
PERSONAL PROTECTION:	

NFPA® 704 CODES

Approximate HMIS and NFPA Risk Ratings Legend:

0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

CAA (Clean Air Act, USA)

This product does not contain any class 1 ozone depleting substances.

This product does not contain any class 2 ozone depleting substances.

This product does not contain substances that are listed as hazardous air pollutants.

EPCRA (Emergency Planning and Right to Know Act, USA, 40 CFR 372.45)

This product contains aluminum oxide (CAS# 1344-28-1), which is subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

TSCA (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, June 06, 2014 revision, USA).

This product does not contain any of the listed substances.

Europe**RoHS** (Restriction of Hazardous Substances Directive)

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP and complies with European RoHS regulations.

WEEE (Waste Electrical and Electronic Equipment Directive)

This product is not a piece of electrical or electronics equipment, and is therefore not governed by this regulation.

SUPER THERMAL GREASE III**8617****Section 16: Other Information****SDS Prepared by** Michel Hachey**Date of Revision** 21 December 2018**Supersedes** 20 June 2017**Reason for Changes:** Minor format and statement revisions and product name correction**Reference**

1) ACGIH 2017 TLVs and BEIs: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices, American Conference of Governmental of Industrial Hygienist Cincinnati, OH (2017).

2) All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
NOELR	No observable effect loading ratio
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
PEL	Permissible Exposure Limit
STEL	Short-Term Exposure Limit
TCLo	Lowest published toxic concentration
TWA	Time Weighted Average
VOC	Volatile Organic Content
WEEL	Workplace Environmental Exposure Levels

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Technical Queries Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at www.mgchemicals.com.

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Disclaimer This material safety data sheet is provided as an information resource only. *M.G. Chemicals, Ltd.* believes the information contained herein is accurate and compiled from reliable sources. It is the responsibility of the user to query and verify any information seeming suspect where doubt on the validity may exist. The buyer assumes all responsibility of using and handling the product in accordance with local, regional, national, and international regulations.

Super Thermal Grease III

Description

8617 is a zinc oxide-free thermally conductive paste. It is designed to reduce thermal resistance between irregular metal surfaces. It can be shipped non-regulated in all sizes, making it convenient for high volume users. It is most commonly used to improve heat flow between heat sinks, LEDs, motors, and heat-generating electronic components such as CPUs, GPUs, and power components.

Features and Benefits

- High thermal conductivity of 1.0 W/m·K
- Zinc oxide-free—ships non-regulated in all sizes
- Silicone-free
- Broad service temperature of -68 to 165 °C (-90 to 329 °F)
- High dielectric strength
- Excellent corrosion resistance
- Non-bleeding
- Non-electrically conductive
- Long service life

Usage Parameters

Properties	Value
Shelf life	5 y
Theoretical coverage for 85 mL tube ^{a)}	<33 500 cm ² [<36 ft ²]

a) Estimate based on 25 µm [1.0 mil] thickness and 100% transfer efficiency.

Temperature Ranges

Properties	Value
Constant service temperature	-68 to 165 °C [-90 to 329 °F]
Storage temperature limits	-10 to 40 °C [14 to 104 °F]

Properties

Thermal Properties	Method	Value
Thermal conductivity @25 °C [77 °F]	ASTM E 1461	1.0 W/(m·K)
Heat capacity @25 °C [77 °F]	—	1.11 J/(g·°C)
Contact thermal resistance ^{a)}	ASTM E 1225	0.71 x 10 ⁻³ (m ² ·K)/W
Electrical Properties	Method	Value
Volume resistivity (ρ _v) @500 V	ASTM D 257	9.9 × 10 ⁹ Ω·cm
Volume conductivity (σ _v) @500 V	ASTM D 257	1.0 × 10 ⁻¹⁰ S/cm
Dielectric strength ^{b)}	ASTM D 149	450 V/mil [17.6 kV/mm]
Breakdown voltage	ASTM D 149	4 500 V [4.5 kV]
Dielectric constant @1 000 cps @10 000 cps	ASTM D 150 ASTM D 150	6.07 5.85
Dissipation factor @1 000 cps @10 000 cps	ASTM D 150 ASTM D 150	0.08 0.02
Grease Properties	Method	Value
Evaporation loss, 22 h @165 °C [329 °F]	ASTM D 2595	2.3%
Oil separation, 30 h @165 °C [329 °F]	ASTM D 6184	1.0%
Dropping point	ASTM D 2265	>308 °C [>586 °F]
Water washout @38 °C [100 °F] ^{c)}	ASTM D 1264	1.5%
Worked penetration, 60 strokes, ½ scale	ASTM D 1403	343
Pressure vessel oxidation test @100 h	ASTM D 942	5.5 psi drop
Copper corrosion @100 °C [212 °F], 24 h	ASTM D 4048	1a, shiny

a) Tested with stainless steel plates.

b) Test as per SAE AS8660: ½ inch hemispherical electrodes 500 V/s rate of rise, 50% R.H. @10 mil gap.

c) Bearing dried at 77 °C [171 °F].

Properties

Physical Properties	Method	Value
Color	Visual	White
Odor	—	Odorless
Density @25 °C [77 °F]	ASTM D 1475	1.96 g/mL
Viscosity	IPCTM-65- Method 2.4.24.4	120 Pa·s ^{a)}
Lubricant	—	No
Bleed	—	Yes
Corrosion resistant	—	Yes
Fillers	—	Aluminum oxide and boron nitride
Synthetic Oil Properties	Method	Value
Oil viscosity index ^{b)}	ASTM D 2270	>110
Fire point ^{c)}	ASTM D 92	321 °C [609.8 °F]
Flash point	ASTM D 92	>290 °C [>554 °F]

Note: Values based on synthetic oil component only.

a) Brookfield viscometer at 12 rpm with spindle RV S94.

b) High oil viscosity index of more than 100 indicates a small oil viscosity change with temperature.

c) Temperature at which oil will continue to burn for at least 5 s after ignition with an open flame.

Storage

Store between -10 and 40 °C [14 and 104 °F] in dry area.

Health, Safety, and Environmental Awareness

Please see the 8617 Safety Data Sheet (SDS) for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Application Instructions

To apply the grease:

1. Wear protective gloves.
2. Clean and dry the surface being lubricated with a lint-free cloth or brush and a zero-residue cleaning solvent, such as MG 824 Isopropyl Alcohol.
3. Apply a thin, even layer of grease using a spatula or other appropriate application tool.

Packaging and Supporting Products

Cat. No.	Packaging	Net Volume	Net Weight	Packaged Weight
8617-85ML	Tube	85 mL [2.87 fl oz]	166 g [5.87 oz]	0.2 kg [0.4 lb]
8617-1P	Jar	473 mL [1.00 pt]	926 g [2.04 lb]	1.0 kg [2.2 lb]
8617-1G	Pail	3.78 L [1.01 gal]	7.40 kg [16.3 lb]	7.65 kg [16.8 lb]

Contact M.G. Chemicals if custom packaging or sizes are required.

Technical Support

Please contact us regarding any questions, suggestions for improvements, or problems with this product. Application notes, instructions and FAQs are located at www.mgchemicals.com.

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